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PATENT SPECIFICATION 640,877

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Complete Specification Published : Aug. 2, 1950.

Index at Acceptance :—Class 52(ii), J1i.

PROVISIONAL SPECIFICATION.

Improvements in Locking and Release Mechanisms for Slidably Adjustable Seats.

I, LAURENCE FRANCIS MORONEY, of 1 Walker Street, Moonee Ponds, near Melbourne, in the State of Victoria, Commonwealth of Australia, a British Subject, do hereby declare the nature of this invention to be as follows :—

This invention relates to improvements in locking and release mechanisms for slidably adjustable seats, and it has more particular reference to improved locking and release means for seat control means of the character set out in the specification of my co-pending Application Nos. 29765-6-7/47 (Serial No. 629,578) for Letters Patent.

A seat control means described and illustrated in the specification of my said Application was particularly adapted for use in an automobile, and it consisted of two generally similar devices, each comprising a lower assembly to be secured to the automobile floorboards and including a lower channel with bearing balls therein : an upper assembly to be secured below the automobile seat and including an upper inverted channel the lower portions of which were adapted to pass around and partially under the lower channel on both sides and adapted to bear on the bearing balls and to be slidable along the lower channel : a longitudinally disposed toothed or notched rack pivotally connected at its rear to the rear of the upper assembly and movable therewith ; a fixed stop member secured to the lower assembly ; the upper assembly being freely movable longitudinally when the rack was in lowered position, the rack being, however, adapted to engage with the stop member when in raised position to prevent such longitudinal movement. Normally, the rack was urged to such raised locking position by means of a bearer associated with the lower assembly and on which the rack rested. Means were provided to lower the bearer, and associated with the bearer was a release member adapted, when the bearer was so lowered, to throw the rack downwardly out of engagement with the stop member.

In order that the racks of both mechanisms could be simultaneously disengaged from the stop members to permit longitudinal adjustment of the seat, and so that the two racks could simultaneously be urged upwardly into locking position to lock the seat in adjusted position, there was provided a rotatably mounted cross-bar connecting the two lower assemblies. Extending rigidly from the cross-bar were two actuating members ; and means were provided to impart rotational movement to the cross-bar, causing each of the actuating members to co-act with a bearer and associated release member to bring the rack of one mechanism to unlocked position.

The means for imparting rotational movement to the cross-bar included a flexible control cable connected to an arm extending from the cross-bar.

It has been found in practice that the use of the cross-bar results in several disadvantages, particularly in fitting the invention to automobiles. Owing to the variation in the sizes of automobiles, it frequently becomes necessary to shorten the cross-bar, as by cutting a part therefrom and welding the cut ends together. When this is done, it is of great importance that the actuating members should remain parallel to ensure simultaneous locking or unlocking operation of the two mechanisms. Furthermore, the construction of some automobiles requires that the cross-bar should be bowed at its mid-portion to pass an obstruction in the form of a cover for the tail shaft of the vehicle.

My present invention has been devised with the principal object of overcoming the said present disadvantages by providing seat control means of the character set out having improved means whereby the two mechanisms may be simultaneously locked or unlocked, such improved means being simple and economical to manufacture and of such character that they facilitate the installation of the seat control means in a vehicle.

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With this and other objects in view, my invention resides broadly in a slidably adjustable seat mounting of the type wherein two mechanisms are provided each having a lower assembly secured to a stable base and an upper assembly secured to a seat and slidable longitudinally in relation to the lower assembly, a toothed or notched rack being pivotally connected at its rear end to the rear end of each upper assembly and adapted to engage, when in raised position, with a fixed stop member secured to the lower assembly, a pivoted bearer member located below each rack and adapted normally to urge the rack upwards to engaging position, and means for lowering the bearer members to disengage the racks, characterized in that the means for lowering the bearer member includes a bell crank adapted to depress each bearer member, the two bell cranks being connected in sprung manner to a compensating lever; and means are provided for moving the compensating lever to actuate the bell cranks simultaneously to depress the said bearer members.

According to one practical form of my invention, described by way of illustrative example only, I provide a seat control apparatus consisting of two mechanisms, each having a lower assembly and an upper assembly. The lower assembly includes a sheet metal standard of L-shaped cross-section, the lower portion being bolted to floor-boards of an automobile. The upper edge of the standard is formed with four sets of three integral adjacent upstanding lugs. A lower channel consisting of a length of metal of substantially semi-circular cross-section has four longitudinal slots formed along its centre line which receive the four sets of lugs of the standard. The two outermost lugs of the two outermost sets are bent over in opposite directions, and the two innermost lugs of the two innermost sets are likewise bent over in opposite directions, the bent-over lugs securing the lower channel firmly on the standard. The other four upstanding lugs form stops which define two runways for bearing balls, one in each runway, and of such diameter that they fit closely in the lower channel but will run easily therein.

The upper assembly comprises an upper inverted channel somewhat longer than the lower channel with a sheet metal seat bearer of inverted " top-hat " section, apertured to facilitate its attachment to an automobile seat, secured to its top. In cross-section the upper portion of the upper inverted channel is curved arcuately to about the same radial length as that of the lower channel, and is adapted to bear upon the bearings balls. Therebelow, on either side, the upper inverted channel is shaped to fit closely about the lower channel, its lower edges closely approaching the standard on either side. The upper channel is adapted to slide freely longitudinally over the lower channel, running freely and with little friction on the bearing balls, but cannot, however, be lifted from the lower channel or rotated laterally for more than a small amount. The runways are packed with lubricating grease which forms plugs at either end of the lower channel, preventing ingress of dust and grit. The enclosing construction of the upper inverted channel acts further to prevent foreign matter from entering the mechanism.

Means are provided to hold the seat in desired adjusted position, such means including an upstanding bracket secured to and extending laterally from the standard of each lower assembly towards the other lower assembly. Each of the brackets has an upright slot formed therein. To the rear of each seat bearer there is pivoted one end of a rack, consisting of a metal strip notched at spaced intervals along its upper edge, the rack passing through the slotted bracket. When the rack is in lowered position, the upper assembly may be moved freely along the lower assembly, the rack passing through the slot; but when the rack is raised, a notch thereof engages with the upper portion of the slotted bracket and prevents such movement. The rack is normally held in raised position by means of a bearer member consisting of a metal element curved from front to rear and disposed below the rack. The bearer is pivoted laterally at its rear, and secured to it is a release element consisting of an inverted L-shaped member, the lateral arm of which is located closely above the top of the rack. A spring normally maintains the bearer in raised position, forcing the rack into engagement with the slotted bracket.

Secured to the slotted bracket of each seat control mechanism is a lateral bracket extending inwardly, and to each lateral bracket there is pivotally connected a bell crank, of which one arm is curved or cam shaped and adapted to bear on the upright arm of the inverted L-shaped release element.

There is secured to the automobile floor-boards, at a location between the two seat control mechanisms, an anchor plate which is formed with a substantially central dome or convexity. To the top of this dome a substantially T-shaped lever is pivotally connected as by means of a rivet, at or about the junction of its three arms. The two opposed arms of this lever are connected to the two bell cranks of the seat control mechanisms, the connecting means in each case including a tension spring, and, for example, a length of cable. The third arm of the lever forms an actuating arm.

There is provided a flexible control cable

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of well known type which is connected at one end to the actuating arm, and at the other end to a pull-knob located in a convenient position such as on the dash-board of the automobile. When, then the pull-knob is pulled, the control cable is tensioned, and, being connected to the actuating arm of the T-shaped lever causes the said lever to be turned. The opposed arms of the said lever move the bell cranks to which they are connected in such manner that the cam-shaped arms of the said bell cranks depress the release members and the connected bearer elements against the action of the associated springs, the depression of the bearer members permitting the racks to be lowered, and the release elements throwing the racks downwards out of engagement with the slotted brackets through which they pass. The automobile seat may then be freely moved backwards or forwards as desired, and when the said seat is in correct adjustment, the pull-knob is released. Thereupon the bearer members and release elements are raised by their associated springs, urging the racks upwards and the T-shaped lever is drawn to original position. If the racks are in such position that notches do not immediately engage with the slotted brackets, the first slight movement longitudinally of the seat will cause them to come to engaging position. If the seat should be somewhat skewed, and one rack only should not be in a position to engage with its slotted bracket, then the other rack will not be prevented in any way from coming immediately into locking position.

My invention will be found to be very effective in achieving the objects for which it has been devised. It will be understood, of course, that the form of my invention hereinbefore described by way of example may be subject to modifications of constructional detail and design which are, however, deemed to reside within the scope and ambit of my invention, the nature of which has been herein described.

Dated this 23rd day of September, 1948.

LAURENCE FRANCIS MORONEY.

By:
ERIC POTTER AND CLARKSON,
Chartered Patent Agents,
4/5, Staple Inn, High Holborn,
London, W.C.1.

COMPLETE SPECIFICATION.

Improvements in Locking and Release Mechanisms for Slidably Adjustable Seats.

I, LAURENCE FRANCIS MORONEY, of 1 Walker Street, Moonee Ponds, near Melbourne, in the State of Victoria, Commonwealth of Australia, British Subject, do hereby declare the nature of this invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to improvements in locking and release mechanisms for slidably adjustable seats, and it has more particular reference to improved locking and release means for seat control means of the character set out in the specification of my co-pending Application Nos. 28765-6-7/47 (Serial No. 629,578) for Letters Patent.

A seat control means described and illustrated in the specification of my said Application was particularly adapted for use in an automobile, and it consisted of two generally similar devices, each comprising a lower assembly to be secured to the automobile floorboards and including a lower channel with bearing balls therein; an upper assembly to be secured below the automobile seat and including an upper inverted channel the lower portions of which were adapted to pass around and partially under the lower channel on both sides and adapted to bear on the bearing balls and to be slidable along the lower channel; a longitudinally disposed toothed or notched rack pivotally connected at its rear to the rear of the upper assembly and movable therewith; a fixed stop member secured to the lower assembly; the upper assembly being freely movable longitudinally when the rack was in lowered position, the rack being, however, adapted to engage with the stop member when in raised position to prevent such longitudinal movement. Normally, the rack was urged to such raised locking position by means of a bearer associated with the lower assembly and on which the rack rested. Means were provided to lower the bearer, and associated with the bearer was a release member adapted, when the bearer was so lowered, to throw the rack downwardly out of engagement with the stop member.

In order that the racks of both mechanisms could be simultaneously disengaged from the stop members to permit longitudinal adjustment of the seat, and so that the two racks could simultaneously be urged upwardly into locking position to lock the seat in adjusted position, there was provided a rotatably mounted cross-bar connecting the two lower

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assemblies. Extending rigidly from the cross-bar were two actuating members; and means were provided to impart rotational movement to the cross-bar, causing each of the actuating members to co-act with a bearer and associated release member to bring the rack of one mechanisms to unlocked position. The means for imparting rotational movement to the cross-bar included a flexible control cable connected to an arm extending from the cross-bar.

It has been found in practice that the use of the cross-bar results in several disadvantages, particularly in fitting the invention to automobiles. Owing to the variation in the sizes of automobiles, it frequently becomes necessary to shorten the cross-bar, as by cutting a part therefrom and welding the cut ends together. When this is done, it is of great importance that the actuating members should remain parallel to ensure simultaneous locking or unlocking operation of the two mechanisms. Furthermore, the construction of some automobiles requires that the cross-bar should be bowed at its mid-portion to pass an obstruction in the form of a cover for the tail shaft of the vehicle.

My present invention has been devised with the principal object of overcoming the said present disadvantages by providing seat control means of the character set out having improved means whereby the two mechanisms may be simultaneously locked or unlocked, such improved means being simple and economical to manufacture and of such character that they facilitate the installation of the seat control means in a vehicle.

With this and other object in view, my invention resides broadly in a slidably adjustable seat mounting of the type wherein two mechanisms are provided each having a lower assembly adapted to be secured to a stable base and an upper assembly adapted to be secured to a seat and slidable longitudinally in relation to the lower assembly, a toothed or notched rack being pivotally connected at its rear end to the rear end of each upper assembly and adapted to engage, when in raised position, with a fixed stop member secured to the lower assembly, a spring-loaded pivoted bearer member located below each rack and adapted normally to urge the rack upwards to engagement with the stop member, and means for lowering the bearer members to disengage the racks from the stop members, characterized in that the means for lowering the bearer members includes a lever mechanism associated with each bearer member; an actuating lever; sprung connections, each connecting one of the lever mechanisms to the actuating lever; and means for moving the actuating lever in such manner as to actuate the two lever mechanisms simultaneously to depress the bearer members.

In order that a preferred embodiment of my invention may be more easily understood and readily put into practical effect, I now refer to the accompanying drawings wherein:

Fig. 1 illustrates in perspective a slidably adjustable seat mounting according to my invention, and

Fig. 2 shows in end elevation, and to enlarged scale, one of the mechanisms of the mounting depicted in Fig. 1.

The slidably adjustable automobile seat mounting illustrated includes two mechanisms, each of which has a lower assembly and an upper assembly. The lower assembly includes a sheet metal standard 10 of substantially L-shaped cross-section, the lower portion or base 11 being provided with apertures 12 whereby the standard may be bolted to floorboards of an automobile. The upper edge of the standard is formed with four sets of three integral adjacent upstanding lugs 13. A lower channel 14 consisting of a length of metal of substantially semi-circular cross-section has four longitudinal slots formed along its centreline which receive the four sets of lugs of the standard. The two outermost lugs 13 of the two outermost sets are bent over in opposite directions, as shown in Fig. 2, and the two innermost lugs of the two innermost sets (not shown) are likewise bent over in opposite directions, the bent-over lugs securing the lower channel 14 firmly on the standard, as more fully described in my said co-pending Application for Letters Patent. The other four upstanding lugs 13 form stops which define runways for bearing balls 15, one in each runway, and of such diameter that they fit closely in the lower channel but will run easily therein.

The upper assembly of each mechanism comprises an upper inverted channel 16, somewhat longer than the lower channel 14, and having secured to its top a sheet metal seat bearer 17 of inverted "top-hat" section, with apertures 18 to facilitate its attachment to an automobile seat. In cross-section, the upper portion of the upper inverted channel 16 is curved arcuately to about the same radial length as that of the lower channel 14 and is adapted to bear upon the bearing balls 15. Therebelow, on either side, the upper inverted channel is shaped to fit closely about the lower channel 14, its lower edges closely approaching the standard 10 on either side. The upper channel 16 is adapted to slide longitudinally over the lower channel, running with little friction on the bearing balls 15, but cannot be lifted from the lower channel 14 or rotated laterally for more than a small amount. The runways are packed with lubricating grease which forms plugs at either end of the

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lower channel, preventing ingress of dust and grit.

The means whereby an automobile seat mounted on the two mechanisms may be releasably locked in desired adjusted position include, in association with each mechanism, an upstanding bracket 19, L-shaped in plan view, welded to the standard 10. The front or lateral arm of the bracket has an upright slot 20 formed therein. To the rear of each seat bearer 17 there is pivoted one end of a rack 21, consisting of a metal strip having notches 22 formed at spaced intervals along its upper edge, the rack passing through the slot 20 of the bracket 19. When the rack 21 is in lowered position, the upper assembly may be moved freely along the lower assembly, the rack passing through the slot 20; but when the rack 21 is raised, a notch 22 thereof engages with the upper portion of the slotted bracket 19 and prevents such movement. Stops 23 passing laterally through the rack 21 limit the forward and rearward movement of the rack through the slot 20.

The rack is normally held in raised position by means of a bearer element 24 consisting of a metal strip located laterally below the rack and welded to a metal rod 25, the rear end portion of which extends rearwardly of the bearer element 24 and is rotatably mounted in a bearing 26 welded to the side or longitudinal arm of the bracket 19. The front end portion of the metal rod 25 is bent downwardly in front of the bearer element 24 to form a lever arm 27 which is apertured at its lower end. The metal strip of which bearer element 24 is formed is carried upwardly above the metal rod 25 and is bent over so that it is disposed laterally above the rack 21, to form a release element 28.

Normally the bearer element 24 is maintained in raised position to hold the rack 21 in engagement with the slotted bracket 19 by means of a helical tension spring 29, one end of which is secured in the aperture at the lower end of the lever arm 27, the other end being secured as by a split pin 30 to the standard 10.

The salient feature of my present invention resides in the improved means whereby the bearer elements 24 of the two mechanisms may be simultaneously lowered to enable the racks 21 to be freed of the slotted brackets 19, the release elements 28 at the same time acting to throw the racks to lowered disengaged positions, and whereby the two bearer elements 24 may be simultaneously permitted to urge the two racks 21 upwardly, any failure of one rack to immediately engage with its slotted bracket 19 not, however, preventing the immediate locking of the other rack. Between the two mechanisms of the seat mounting there is provided an intermediate bracket 31 formed with apertures 32 whereby the said bracket may be bolted to the floorboards of an automobile. To the top of the said intermediate bracket a substantially T-shaped actuating lever 33 is pivotally connected by a pin 34, at about the junction of the three arms of the said lever. Each of the opposed arms of the actuating lever 33 is formed with an upstanding lug 35 which is apertured to receive an eye-bolt 36 which engages an adjustment nut 37, the two bolts 36 being oppositely directed.

To each of the lever arms 27 there is attached a helical tension spring 38, one end of which is engaged in the aperture at the lower end of the said lever arm 27. The other end of each spring 38 is connected to the eye of an eye-bolt 36 by a connecting rod or wire 39 as illustrated, the ends of each rod or wire 39 being shaped to a U-bend and engaged with the end of the spring 38 and with the eye-bolt, the doubled portion at each end of the rod or wire 39 being secured by a metal sleeve 40. The third arm of the actuating lever 33 is apertured at its outer end for engagement by a flexible control cable 41, the end of which is passed through the aperture in the said arm, doubled over and secured by a sleeve 40 as above described. At its other end (not shown) the flexible control cable 41 is preferably connected to a pull-knob conveniently located, for example, on the dash-board of the automobile.

When the pull-knob is pulled, the control cable 41 is tensioned and causes the actuating lever 33 to be turned in such manner that the connecting rods or wires 39, acting through the tension springs 38, draw the lever arms 27 inwardly against the action of the tension springs 29. Consequently, the bearer elements 24 are simultaneously lowered, and the release members 28 bear down on the racks 21 (if friction should have prevented them from falling gravitationally) and throw them out of engagement with the slotted brackets 19. The automobile seat fitted to the mounting may then be easily moved forward or back as desired to adjusted position, whereupon the pull-knob is released. The tension springs 29 then act to draw the lever arms 27 outwardly and urge the bearer elements 24 upwardly to force the racks 21 into engagement with the slotted brackets 19. If, by chance, one of the racks 21 strikes the upper end of a slot 20 between two succeeding notches 22 so that it cannot engage with the slotted bracket 19, then the other rack is in no way hindered from being brought to locked position; and normal movement and vibration will shortly bring the non-locked rack to such position that its spring 29 will cause it to engage with the slotted bracket 19.

The use of my invention will enable the

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two seat mounting mechanisms to be quickly and simply bolted to the floorboards of an automobile with the use of little skill, and the necessary connection to enable the two mechanisms to be locked or released at the same time may then be secured in place quickly and easily.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is :—

1. A slidably adjustable seat mounting of the type wherein two mechanisms are provided each having a lower assembly adapted to be secured to a stable base and an upper assembly adapted to be secured to a seat and slidable longitudinally in relation to the lower assembly, a toothed or notched rack being pivotally connected at its rear end to the rear end of each upper assembly and adapted to engage, when in raised position, with a fixed stop member secured to the lower assembly, a spring-loaded pivoted bearer member located below each rack and adapted normally to urge the rack upwards to engagement with the stop member, and means for lowering the bearer members to disengage the racks from the stop members, characterized in that the means for lowering the bearer members includes a lever mechanism in association with each bearer member ; an actuating lever ; sprung connections, each connecting one of the lever mechanisms to the actuating lever ; and means for moving the actuating lever in such manner as to actuate the two lever mechanisms simultaneously to depress the bearer members.

2. A slidably adjustable seat mounting according to Claim 1 and further characterized in that each bearer member is located laterally beneath the rack, is pivoted about a longitudinal axis, and has secured thereto a release member located laterally above the rack and so arranged that when the bearer member is depressed pivotally about its axis the release member is adapted to act to force the rack downwardly.

3. A slidably adjustable seat mounting according to either of the preceding claims and further characterized in that the lever mechanism associated with each bearer member consists of a lever arm secured to the bearer member.

4. A slidably adjustable seat mounting according to any one of the preceding claims and further characterized in that the actuating lever includes an arm fulcrumed at an intermediate point, each end of the said arm being connected by a sprung connection to a lever mechanism associated with one of the bearer members.

5. A slidably adjustable seat mounting according to any one of the preceding claims and further characterized in that each sprung connection comprises a helical tension spring adapted to be connected at one end to a lever mechanism of a bearer member and connected at the other end to one end of a connecting rod, the other end of the connecting rod being adapted to be connected in screw-threadedly adjustable manner to the actuating lever.

6. A slidably adjustable seat mounting according to any of the preceding claims and further characterized in that the actuating lever is adapted to be moved by a flexible control cable adapted to be tensioned by a pull-knob.

Dated this 6th day of September, 1949.

LAURENCE FRANCIS MORONEY.

By :

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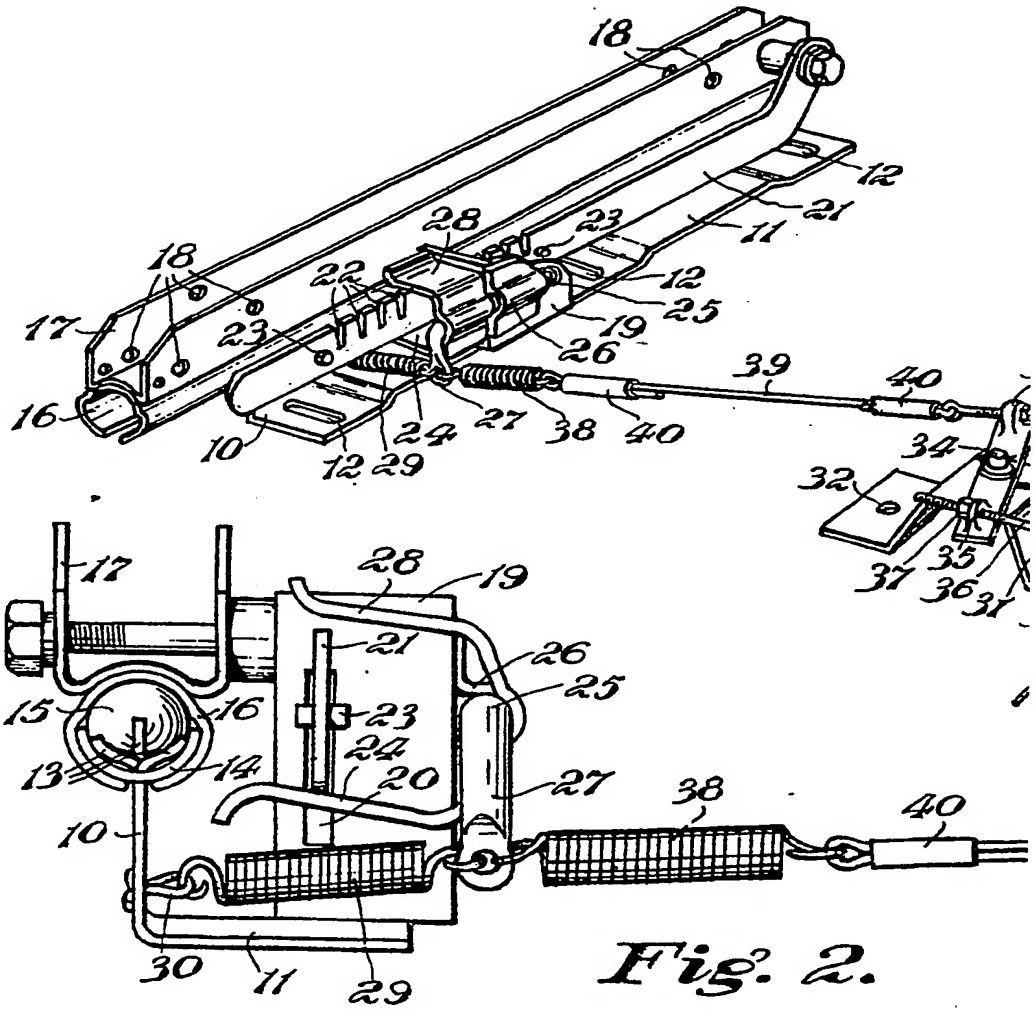

Fig. 2.

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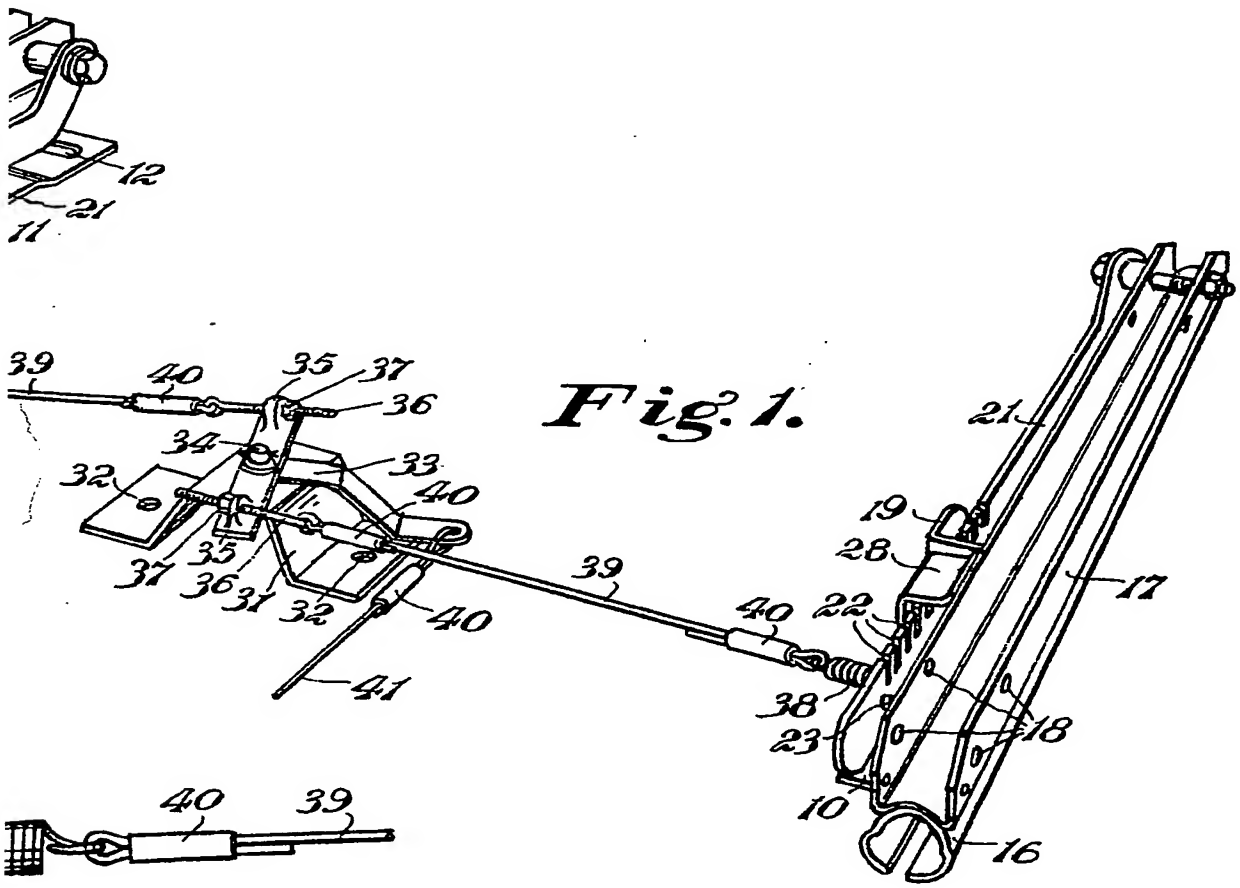

Fig. 1.

Fig. 2.

H.M.S.O.(Ty. P.)

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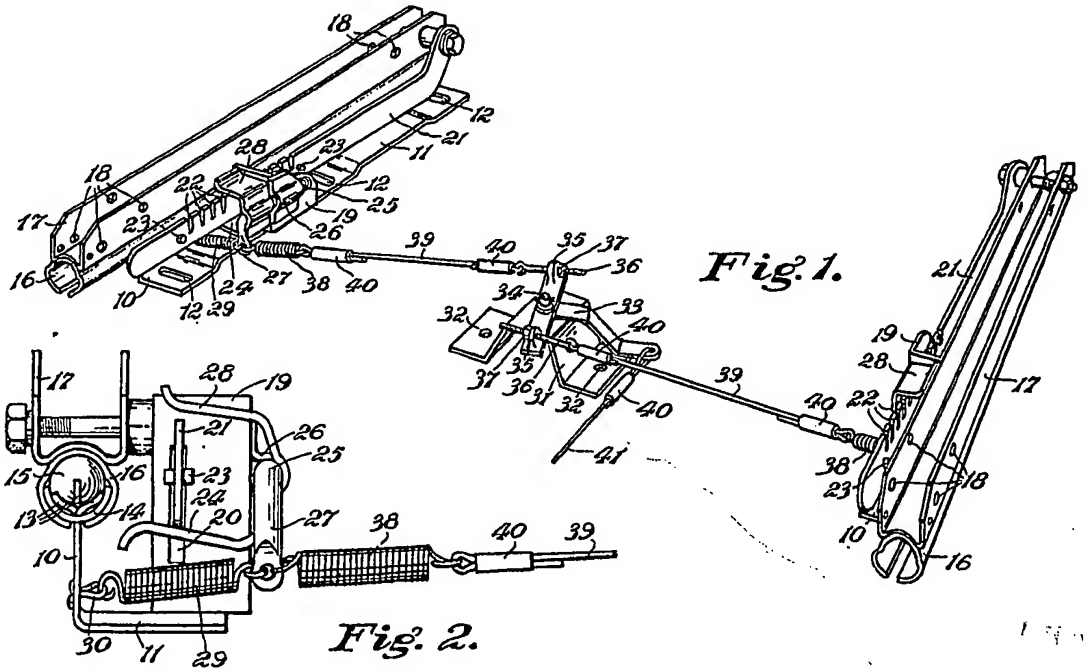

Fig. 1.

Fig. 2.

H.M.S.O. (Ty. P.)